

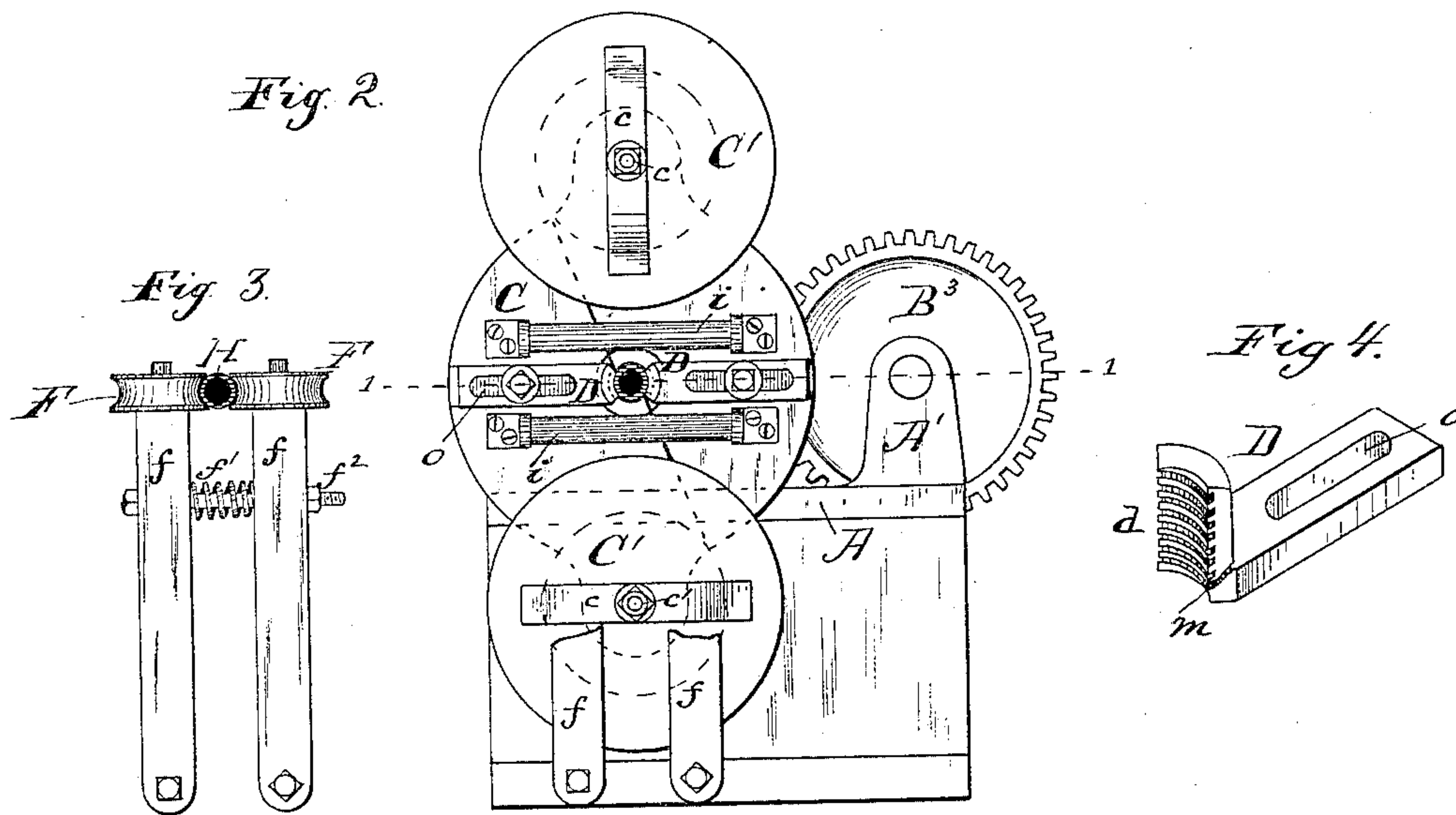
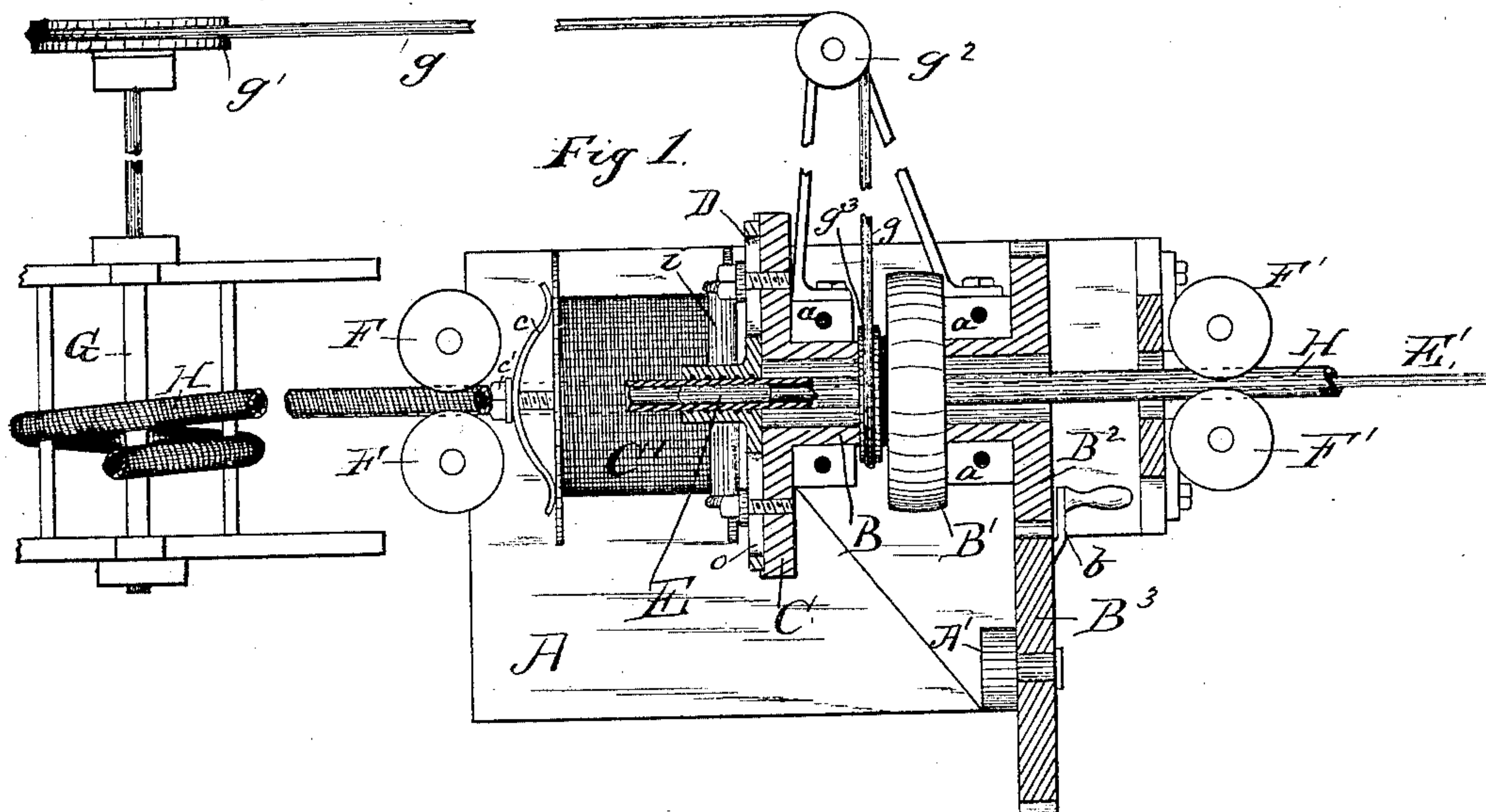
(No Model.)

G. B. DURKEE.

MACHINE FOR COVERING HOSE WITH WIRE.

No. 318,457.

Patented May 26, 1885.



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# UNITED STATES PATENT OFFICE.

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OF SAME PLACE.

## MACHINE FOR COVERING HOSE WITH WIRE.

SPECIFICATION forming part of Letters Patent No. 318,457, dated May 26, 1885.

Application filed January 15, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. DURKEE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Machines for Covering Hose with Wire, of which the following is a specification.

This invention relates to mechanism for automatically winding wire upon rubber hose, thereby providing the latter with a wire shield, and is designed to facilitate that operation.

The main features of the invention are the following: The hose operated upon being flexible, it is essential that it be filled out or rendered reasonably rigid by some means at the time it is covered, so that the wire may not be wound too closely, to permit its expansion to the full extent when in use, and for this purpose I employ a rigid mandrel or core just filling the hose without creating such friction as to impede the passage of the latter through the machine, and support this core upon an arm of such length as will permit the covering of full-length hose; second, in order to keep the wire under control until it is "set," and prevent the coils from climbing upon one another, and at the same time to insure the feed or passage of the hose through the machine as it is covered, I combine with the wire-supplying spool or spools one or more guides or chucks provided with a series of spiral grooves, through which the wire passes and by which it is laid upon the hose in regular even coils, the continued revolution of these guides around the hose forcing the latter along by a pushing force exerted upon the coils; third, as the pushing feed just mentioned may not always be sufficient or desirable, I sometimes employ a receiving-reel, to which a modicum of power is applied, so that it may exert a pull upon the hose and assist its progress through the machine; fourth, that the hose may pass through the machine without yielding to any torsional force exerted by the winding operation, I find it useful to employ a pair of clamping-rollers acting upon the wound hose as soon as it passes beyond the wire-winding devices.

These and other features of the invention

will be more fully understood by reference to the drawings forming a part hereof, wherein—

Figure 1 is a partial plan and partial section of my machine, the section being upon the line 1 1 of Fig. 2. Fig. 2 is a front elevation of the winding mechanism, the clamping-rollers being omitted. Fig. 3 is a detail of the clamping-rollers, and Fig. 4 is a perspective of one of the wire guides or chucks.

In said drawings, A represents the bed of the machine, having bearings *a a*, wherein a hollow journal, B, revolves. Through the journal B the hose H passes, and said journal may be actuated either by the pulley B', mounted upon it, or by the gear B<sup>2</sup>, receiving power from gear B<sup>3</sup>, supported upon the part A'.

The machine may be operated by manual labor applied to gear B<sup>3</sup> through crank *b*; but where the pulley B' is actuated the gears B<sup>2</sup> and B<sup>3</sup> are of course unnecessary.

The journal B carries a head, C, upon which are mounted one or more wire spools, C', with which spools a tension device composed of a spring, *c*, with tightening-screw *c'*, is employed. From these spools the wire where-with the hose H is to be covered passes to one or more guides or chucks, D, secured to the head C, and by them is laid upon the hose in regular coils. Said guides or chucks are provided with spirally or screw threaded or grooved faces *d*, and the wire enters the first of the grooves and travels through the others as the hose passes toward the delivery end of the machine, thereby remaining under control of the chucks until it is perfectly set in the coiled form, and preventing the coils from crowding or climbing upon each other. As the chuck or chucks are continuously rotated around the hose the latter is compelled to move forward by the power exerted upon the wire coils by the grooves in the chucks, the coils and grooves acting together after the manner of a male and female screw. I do not deem it necessary to employ a series of spiral grooves where light wire is employed for the covering; but with most sizes the construction of chuck shown will be found advisable.

The hose being soft and easily collapsed re-



quires to be supported or kept expanded at the point where the wire is applied, and for this purpose I insert in the hose a short core or mandrel, E, of such size as to fit the interior of the hose somewhat loosely and not interfere with its passage over the same. This mandrel I support stationarily upon a rod or wire, E', which is of the length required in operating upon a full length of hose. The mandrel prevents the drawing of the wire so tightly as to diminish the available diameter of the hose, an evil which might occur if the mandrel were not present. The mandrel need not exceed two inches in length, and being beveled slightly at each end allows the hose to pass over it with but little friction.

Just in advance of the chucks are placed two or more clamping-rollers, F F, which exert such power upon the hose as to prevent any torsion thereof under the action of the winding devices. These rollers are secured upon arms *f*, *f*, bolted to the bed, and are kept apart by a spring, *f'*, located between the arms. The clamping-power is regulated by the screw-bolt *f*<sup>2</sup>. Similar rollers, F' F', may be employed as guides at the receiving end of the machine if thought advisable, though they should be made to exert but little pressure.

If the pushing feed caused by the chucks should prove insufficient or undesirable, the reel G may be employed to assist in that function by exerting a gentle pull upon the wound hose, and such reel may be belted to the journal B, if desired, by the belt *g*, passing over pulleys *g'* *g*<sup>2</sup> *g*<sup>3</sup>, such belt being loose enough to slip and prevent too great strain upon the hose.

In order that the wires may enter the chucks straight instead of at an angle, I pass them behind rollers *i*, located on the head between the spools and chucks, and the latter are cut away at the initial groove, as seen at *m*, Fig. 4, to admit the wire in a direct line from the roller. The chucks are preferably adjustable upon the head to accommodate different sizes of hose, such adjustment being permitted by the elongated slots *o*, through which pass bolts by which they are secured to the head.

I do not wish in all my claims to be limited to a chuck having the spiral grooves, nor to an adjustable chuck, because it is obvious that any guide for the wire, whether adjustable or

non-adjustable, located adjacent to the hose and serving to lay the wire thereon would answer the purpose, though I deem the form of device shown preferable to any other, and I recommend its use.

I claim—

1. In a machine for covering hose with wire, the combination, with the wire carrying and winding head revolving around the hose and having an adjustable guide or guides for laying the wire mounted thereon, of the stationary mandrel for keeping the hose expanded and the support for such mandrel, substantially as specified.

2. In a machine for covering hose with wire, the combination, with the wire carrying and winding head revolving around the hose, of one or more guiding-chucks having spirally-threaded faces, substantially as specified.

3. In a machine for covering hose with wire, the combination, with the wire-carrying head and a guide or guides for laying the wire mounted upon said head, of the mandrel for keeping the hose expanded and the support for such mandrel, substantially as specified.

4. In a machine for covering hose with wire, the combination, with the wire carrying and winding head revolving around the hose and the expanding-mandrel, of the clamping-rollers F F, located as shown, for preventing torsion of the hose, substantially as specified.

5. The combination, with a machine for winding wire upon rubber hose, of a power-actuated reel, G, belt *g*, and pulleys *g'*, *g*<sup>2</sup>, and *g*<sup>3</sup>, substantially as and for the purpose specified.

6. In a machine for covering hose with wire, the wire-carrying head having the guiding chuck or chucks, the hose-expanding mandrel and its support, and the clamping-rollers F F, all combined and arranged substantially as specified.

7. The combination, with the head rotating around the hose, of the wire-supplying spool or spools, the chucks, and the guiding-rollers, all carried by the head, substantially as specified.

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Witnesses:

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